

**TESTIMONY OF RICHARD B. HOLLIS  
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**BEFORE THE SUBCOMMITTEE ON EMERGENCY PREPAREDNESS,  
SCIENCE AND TECHNOLOGY,  
OF THE COMMITTEE ON HOMELAND SECURITY,  
UNITED STATES HOUSE OF REPRESENTATIVES**

**BIOSHIELD: LINKING BIOTERRORISM THREATS AND  
COUNTERMEASURE PROCUREMENT TO ENHANCE TERRORISM  
PREPAREDNESS**

**July 12, 2005**

Mr. Chairman, Ranking Member Pascrell, distinguished members of the Committee:

Thank you for the opportunity to testify before you today. Before I begin, allow me to thank you personally for your longstanding leadership, both as a Committee and individually, to help safeguard this nation against terrorism, and specifically against the threat posed by weapons of mass destruction.

My name is Richard Hollis. I am Chairman and Chief Executive Officer of Hollis-Eden Pharmaceuticals. Hollis-Eden is a San Diego-based Biotechnology Company founded in 1994 and publicly traded on the NASDAQ stock exchange since 1997. Hollis-Eden has under development a number of proprietary immune-regulating hormones, compounds that are key components of the human immune system. We believe that by properly utilizing these hormones we can help the body to mount an appropriate immune or metabolic response to a number of different diseases or challenges. Specifically, we have developed and tested our compounds for the potential treatment of Acute Radiation Syndrome (ARS, or what is commonly known as "radiation sickness"), among other possible applications.

**THE NUCLEAR THREAT**

The President of the United States, the Vice President, the 2004 Democratic candidate for president Senator Kerry, scores of military leaders, leaders from the medical and scientific community, the intelligence agencies, and leaders in homeland security, as well as the chairman and Vice Chairman of the 911 commission have all publicly stated that the greatest threat to this nation is nuclear proliferation and nuclear material in the hands of a terrorist. In fact, the Director of the Domestic Nuclear Detection Office at DHS

recently stated that, “There is a 100 percent chance someone will try to attack us with a nuclear weapon in the next five to 10 years.”

Imagine that a small nuclear bomb were to go off in Washington or New York or Los Angeles. The bomb is similar to the “mock up” Congressman Curt Weldon often uses to demonstrate how small these devices can be.

The results of such an attack on this nation would be devastating. By extrapolation, the Department of Homeland Security’s Nuclear National Planning Scenario (NNPS)<sup>1</sup> estimates that the number of lives lost from a terrorist attack on a major U.S. city could be as high as one million or more people per detonation.

Contrary to popular belief, the vast majority of the victims of a terrorist nuclear attack would die not from the blast, but from Acute Radiation Syndrome (ARS). ARS is the result of radiation-induced bone marrow damage. Specifically, ARS is characterized by the loss of infection fighting cells and clotting elements that are produced in bone marrow. This loss of the body’s ability to fight infection and prevent bleeding is believed to be the leading cause of sickness and death in the event of a nuclear attack.

In fact, expert estimates of the medical consequences from a nuclear bomb indicate that ARS would likely kill three to five times as many people as the initial blast. For example, the British Medical Journal recently estimated that a 12.5 kiloton bomb detonated in New York City would kill at least 50,000 people instantly. These 50,000 victims would be beyond help. However, the vast majority of victims—between 200,000 to 700,000 people—would die days or weeks later from the effects of ARS.

The sad fact is that the overwhelming majority of these people could be saved if the federal government was better prepared to respond to a nuclear scenario, including deploying the appropriate medical countermeasures.

## **OUR INABILITY TO MANAGE THE AFTERMATH OF A NUCLEAR ATTACK IS CAUSED BY OUR FAILURE TO DEPLOY A DRUG FOR ARS**

No city has the medical surge capacity to handle the massive numbers of ARS casualties: In the wake of a nuclear attack on a major city, medical facilities will be immediately overwhelmed. Adequate hospital and other clinical medical facilities of most large cities are already utilized at or near full capacity. A nuclear attack will destroy scores of beds and take others off-line because they will be in contaminated areas. This would mean little meaningful ability for hospitals to treat the victims of a nuclear blast.

In New York, for example, a study published in the British Medical Journal recently estimated that approximately 1,000 hospital beds would be lost in a nuclear blast and an

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<sup>1</sup> The NNPS here refers collectively to The Planning Scenarios, Executive Summaries, The Homeland Security Council (July 2004), and the accompanying Improvised Nuclear Device, Predecisional Draft (undated).

additional 8700 beds would be contaminated from radiation fallout. Additionally, the bulk of any region's medical personnel—doctors, nurses, technicians, EMT's—are located in the heart of the area most likely to be targeted by such an attack. Most of these medical personnel would be victims of the attack and would not be mission ready to treat other victims.

Additionally, in the wake of an attack, we would expect to see hundreds of thousands of “worried well” flood medical facilities. These people will fear that they have been exposed to radiation and they will seek treatment from whatever medical facilities remain. There is no inexpensive, fast and accurate method to determine the level of radiation exposure and triage radiation victims. This will only complicate the difficult task of determining who is among the worried well, who is sick but can be saved, and who is beyond help. The burden of tens or hundreds thousands of worried well, on top of hundreds of thousands of ARS victims, will immediately overwhelm area medical facilities. The 2004 influenza vaccine shortage gives only a hint of the mass panic and possibly violent demand for medical services that would ensue after a nuclear attack.

Because regional medical facilities will be overwhelmed, one plan is to ship victims to distant care, which will only increase death rates: Because medical resources in the area of any attack will be severely degraded and dangerously over-stretched, we have been briefed by DHS and HHS officials that one element of the plan for handling the injured and dying is to ship them off in buses and trains to remaining medical facilities that are located at a greater distance from the impacted area.

This plan is fundamentally flawed in at least three respects. First, as described in greater detail below, the transportation infrastructure required to move these people will be destroyed or damaged. Second, even if these victims reach medical facilities that have capacity, medical personnel will have little to offer beyond prayers and compassion. Third, and most importantly, because ARS kills by opportunistic infection, putting scores of immune system compromised victims into enclosed buses and trains will only hasten the spread of infection and death. In other words, such evacuation efforts will hurt victims more than they help them.

Without an ARS treatment first responders will be pulled back—not sent in: The typical American believes that if his or her city was hit by a nuclear attack, help, in the form of first responders, military units and medical personnel will come streaming in to assist victims. This ignores the reality that, at present, we have no way to protect first responders from ARS. Because of the lack of protection, we may not be able to afford to risk sending these units into contaminated areas to help victims and to restore order.

We will have to evacuate hundreds of thousands of people within 24 hours, because of radiation: Because there is no approved and effective treatment for people who have been exposed to enough radiation to trigger the onslaught of ARS, the DHS/NNPS is principally focused on evacuation. The NNPS calls for the immediate or near immediate (within 24 hours) evacuation of roughly 450,000 people from the impacted city. The

virtual impossibility of such a mass evacuation is self-evident to anyone who has negotiated rush hour traffic in a major American city.

Without an ARS drug, medical personnel will have little to offer victims of radiation:

Absent a drug to counter ARS, the only available treatments are bone marrow replacement and/or the administration of a drug approved for use in conjunction with chemotherapy. Both of these courses of therapy will be of little to no use after a nuclear attack. These therapies are highly expensive, making them cost prohibitive for a mass casualty event. Both of these treatments require intensive medical care in a fully functioning medical facility. There simply will not be enough hospital beds and medical professionals to administer these treatments on a mass casualty scale after a nuclear attack. The DHS NNPS states, “The level of care that can be expected may be significantly lower than would normally be expected.”

Victims lucky enough to get themselves to aid facilities will be able to receive help in the form of decontamination. This will help halt further radiation damage but do nothing for the harm from the radiation already received. Absent the deployment of NEUMUNE, even remaining hospitals will have no treatment to offer the mass casualties such an attack will produce. For the vast majority of evacuees from the impacted area, currently planned rescue and medical efforts provided at the periphery will have little impact on mortality. In short, hundreds of thousands of Americans could die of ARS because we have no effective treatment in the Strategic National Stockpile.

## **AN EFFECTIVE ARS TREATMENT IS NOW AVAILABLE**

Now imagine that you could rapidly distribute a drug that people could give to themselves much like our soldiers do with auto- injectors following a chemical attack. Imagine that that drug stimulated the body to make white cells to fight infection and platelets to protect you from bleeding. More importantly, imagine that up to 90 percent of the people who receive this treatment could survive.

In fact, such a drug isn't a figment of the imagination. This drug could be procured today under Bioshield and be in the Strategic National Stockpile as early as next year.

Two weeks after the devastating September 11, 2001 attacks on our country, officials from the Armed Forces Radiobiology Research Institute (AFRRI), a research division of the Department of Defense, approached Hollis-Eden and told us that they wanted to fast track the development of one of our experimental drugs for the treatment of ARS. In some early studies with mice, AFRRI found that this compound saved literally 100 percent of the animals that would have otherwise died from acute radiation exposure. Since that time, AFRRI has continued testing and publishing results in the medical literature on this compound, known as NEUMUNE, for use in mitigating the effects of acute, high-level radiation exposure.

To date, results in over 200 non-human primates treated with NEUMUNE have demonstrated that the investigational drug is safe and effective in the treatment of ARS. In one recent trial, 90 percent of the treated primates survived otherwise lethal doses of radiation, but only 55 percent of the untreated group survived. Extrapolating those results to a nuclear attack on a major American city, one can see how dramatic an effect this drug could have on mitigating human casualties.

Testing to date has also shown that the drug is stable and can be easily stockpiled. In addition, NEUMUNE can be self-administered in the field by victims of such an attack, without the need for supportive medical care. This capability would free up medical resources that will be stretched beyond the breaking point. The drug has also exhibited no significant negative side effects. And, assuming a contract of sufficient size to offer economies of scale, we can provide the drug at a cost akin to that of a standard antibiotic.

Moreover, NEUMUNE can be administered before exposure or for some period of time after exposure. The ability to administer the drug before exposure makes NEUMUNE ideal for first responders and military units. Protected by NEUMUNE, such units could safely be sent into the irradiated area carry out rescue, recovery and relief efforts. This ability alone would fundamentally improve our ability to respond to a nuclear attack. More importantly, however, the capability of the drug to be self-administered hours after an attack offer us the potential to save hundreds of thousands of lives if we respond effectively.

Perhaps most importantly, NEUMUNE represents a dramatic breakthrough in our civilian and military security posture when one considers that here is currently no drug in the stockpile for ARS.

With much fanfare, the federal government has stockpiled two compounds, potassium iodide and Prussian Blue, to address radiation injuries; neither of these compounds will save the lives of the upwards of one million people that will die from ARS in the wake of a nuclear attack. Potassium iodide blocks the absorption of certain radioactive isotopes that can lead to thyroid cancer. However, the hundreds of thousands of people who will die from ARS within weeks of a nuclear attack will perish long before they can contract thyroid cancer.

The second drug, Prussian Blue, is a dye used for many years by artists which can act as a chelating agent that helps the body rid itself of radioactive isotopes more quickly, thereby reducing the radiation damage to the gut area. However, Prussian Blue has no impact on the two primary causes of death from ARS: opportunistic infection from immune suppression and bleeding caused by platelet loss. In other words, this compound will not materially impact the numbers of people that will die in the immediate wake of a nuclear attack.

The limitations and possibly over reliance on these drugs gives rise for concern by Congress. In connection with a recent Senate oversight hearing on Project Bioshield implementation, Senator Robert Byrd (D-WV) submitted a question for the record to

Assistant Secretary Stewart Simonson about the status of the procurement and stockpiling of radiation medical countermeasures. Secretary Simonson responded by highlighting the Department's acquisition and pending acquisition of potassium iodide and Prussian Blue. In addition, he cited the possible emergency off-label use of an existing drug now given to cancer patients undergoing chemotherapy.

In addition to the limitations cited of potassium iodide and Prussian Blue, the response failed to indicate that the cancer therapy, in addition to not having been approved specifically for ARS, is prohibitively expensive for mass casualty treatment, must be given in a highly controlled clinical (hospital) setting, must be refrigerated prior to administration, and would likely need to be given in conjunction with adjunctive therapies, like intravenous platelet administration.

In short:

- Drugs now in the stockpile do not address ARS, which will be the primary cause of death from a nuclear attack.
- We need an ARS therapy.

In contrast—and allow me to say this bluntly—every treatment of NEUMUNE given to a victim of such an attack stands to save a life.

I would submit the key question for the Committee to consider is this: Given that the nuclear threat is the greatest threat we face; Given that more than a million lives may be on the line; Given that a promising effective medical countermeasure to a nuclear attack to treat ARS is close to fruition; And considering the fact that nearly four years after the 9/11 terrorist attacks, why hasn't the procurement of this drug apparently been a higher priority for the federal government?

## **THE FAILURE HERE REFLECTS A SERIES OF FUNDAMENTAL DISCONNECTS BETWEEN HHS' AND DHS' ROLE UNDER BIOSHIELD**

### **1. Transparency and leadership are lacking:**

We have worked in Washington for almost 3 ½ years now meeting with numerous government agencies about biodefense. We have witnessed a clear lack of consensus as to:

- What the government wants;
- How much they will buy;
- What they will spend;
- When they will buy it; and,
- Who is making the decisions?

No one seems to be in charge. Who is ultimately responsible? As discussed in greater detail in the next section of this testimony, when gaps are identified in our defenses, we have seen agencies point the finger of blame at other agencies—rather than aggressively fixing the problem.

## **2. Our Bioshield priorities are not coordinated with our national security priorities:**

There is no apparent linkage between the threats identified for Bioshield purchases and the greatest threats identified by security experts for homeland security:

The 9-11 Commission, the President, the intelligence community, DHS, others agree: greatest threat to our nation is the threat of nuclear terror. However, nearly four years after 9-11, and one year after the passage of Project Bioshield there still is no binding statement that the federal government is seeking to buy a medical counter-measure to a nuclear attack that addresses ARS. In fact, we are still waiting on a promised draft RFP.

At the same time, we have purchased and are seeking to purchase counter-measures for a range of biological threats that are important but clearly do not rise to the level of threat that a nuclear attack does. For example DHS and HHS have committed billions on second and third generation anthrax drugs and we still don't have an RFP issued for a first generation ARS therapy. It may be instructive to note that tens of millions of federal dollars have been committed to developing and procuring Ebola vaccines, when to the best of our knowledge Ebola is not easily weaponized and used as a WMD. This should be compared to the all too real and known threat of a nuclear or radiological attack on the United States.

Additionally, there is no single DHS/HHS common list of major WMD threats and intended/desired medical countermeasures to those threats. DHS speaks of one set of threats to the nation—and nuclear is typically first on that list. Meanwhile, HHS procures drugs from a different list, or, at the very least, a list with vastly different priorities. The lack of a list reflects a lack of threat coordination, which hampers our security efforts.

In addition, this lack of a coordinated set of threats to be addressed creates market uncertainties—exactly the opposite of what Bioshield intended. As a result:

- Industry doesn't know what the nation needs to protect itself;
- This leaves the market undefined;
- As a result, industry hasn't become invigorated by Bioshield; and
- Investors are reticent to fund Bioshield ventures.

This climate does not help us deploy medical countermeasures against WMD.

In general, the federal government's Bioshield priorities do not appear to line-up with our national security imperatives.

### **3. DHS' planned nuclear response efforts are based on assumptions that do not reflect the likely post-nuclear war environment:**

Another disconnect is the how DHS plans to respond to a nuclear attack. These plans are fundamental divorced from the reality of the post-nuclear-attack environment.

Because there is no stockpiled way to treat ARS victims, the NNPS focuses on getting people away from radiation contaminated areas as fast as possible. In order to do so, the NNPS calls for the immediate or near immediate (within 24 hours) evacuation of roughly 430,000 people from the impacted city. Let me emphasize that such a Diaspora-scale evacuation is required to reduce the amount of radiation exposure, which is required to prevent ARS, which, in turn, is required because we have no scenario-based, field-ready ARS treatment. Here the NNPS states: "For people in Zones 1 through 5 [heavily irradiated areas] this evacuation . . . is absolutely essential and must take place immediately or it will have a significant impact on the number of lives that will be lost."

These evacuation plans are not grounded in the post-nuclear-attack reality. First, the NNPS states that all infrastructure within ½ mile will be completely destroyed; damage to infrastructure within 3 miles will be severe. Within these areas bridges will be down, tunnels will be flooded, and roads will be damaged or destroyed.

Consider the impact on two of the most likely target cities: Washington, D.C. and New York, N.Y. In Washington, the blast will likely destroy or severely damage roads and bridges that allow passage out from the city to the South and Southwest. Normal prevailing weather conditions will take the fallout plume from Southwest to Northeast. This will eliminate the use of the largest evacuation routes out of the city. These impacts may leave dry-land evacuation routes (e.g., Wisconsin Avenue) that travel to the Northwest as the only passable means of escape. These routes are heavily congested under normal conditions to say nothing of what conditions would be like in the wake of such an attack.

With respect to the island of Manhattan, it is likely that a terrorist nuclear attack would destroy or render unusable most of the bridges that service the city. In addition, train and vehicular tunnels would likely experience flooding as water flows into the crater formed by the blast. This would be particularly true if the terrorist target was one of the main transit tunnel hubs, such as Grand Central or Penn Stations. These impacts would leave only far northern routes available to those seeking to escape fallout from the attack. Here again, under normal rush hour conditions—with far more means and routes of movement available than an attack would leave—these routes can become parking lots for hours as a result of a mere traffic accident.

In addition, in New York, such impacts would likely strand the eight million people who live on Long Island. Depending on the plume path, Long Island residents could be left with little other means of escaping a certain death from radiation exposure except by sea in whatever form of craft they could find.



In both cities even undamaged evacuation routes will be gridlocked by the impacts of the attack. For a distance of 13 or 14 miles, people who are looking in the immediate direction of the blast will be blinded, most temporarily. Immediate flash blindness to people operating vehicles will cause scores of accidents along key evacuation routes. Additionally, countless people who have been exposed to high levels of radiation will get into their cars and drive to get out of the area. These individuals will find themselves stuck in massive tie-ups. Those who are most irradiated will at some point begin to get very sick and die; some of them will be behind the wheel when this occurs. Their cars—in some cases abandoned and in others wrecked—will only further impede the progress of any evacuation.

The NNPS notes that: “If [the city attacked] has an efficient, functional transportation infrastructure that is not bottlenecked by bridges, tunnels or other major obstructions and a high percentage of the population has access to the system, it is certain that [the high numbers of people exposed to deadly dose levels calculated to occur in the NNPS] will be drastically reduced.” Query, what major American city has such a transportation system on its very best day? (See Graph 1.)

Further, it is unlikely that the NNPS called for response can be achieved without first responders. Here again, ARS will block rescue and recovery efforts and frustrate the NNPS’ efforts to save lives.

The typical American believes that if his or her city was hit by a nuclear attack, help—in the form of first responders, military units and medical personnel—will come streaming in to assist victims. This is false. Until such time as NEUMUNE is widely deployed, we have no way to protect first responders who enter the irradiated area from falling victim to ARS. Standard issue breathing devices and protective clothing do nothing to protect individuals from deep-body penetrating gamma radiation. According to the NNPS, “First responders may don [protective gear] to prevent internalization of fallout, but [this gear] does not reduce the gamma or neutron dose from external sources of radiation.”

As a result, first responder units will actually be pulled back from assisting victims in the impacted area to a safe distance perimeter. Those few first responders who ignore these orders, and those already in the irradiated area who remain to help victims, will be working in a highly contaminated environment using equipment that is highly contaminated and suffering from “battlefield stress” that also works to diminish the body’s immune system; they will soon begin to suffer from ARS and their mission readiness will decline precipitously as they go from savior to victim.

The NNPS states obtusely, “In a limited manpower situation, where the total integrated dose that can be absorbed by the finite number of trained and equipped response workers

**Graph 1: ANNUAL  
HOURS OF TRAFFIC  
DELAY PER  
TRAVELER: 2003**

Los Angeles: 93  
San Francisco: 72  
Washington, DC: 69  
Atlanta: 67  
Houston: 63  
Chicago: 58  
Miami: 51  
New York: 49  
Phoenix: 49  
Philadelphia: 38

Source: Texas Transportation  
Institute 2005

is fixed, as it is likely to be during the first few hours [more likely days] after the event, the value of these rescue activities will need to be weighed against those of preventing or reducing the future exposure of people in the high-dose fallout regions downwind.” Lara Shane, DHS’ Director of Public Education recently put this more directly in an article in the National Journal: in the event of a nuclear attack, “We need people to take care of themselves for 72 hours.” Sadly, this 72 hour timeframe is the period of time that will determine life and death for the vast majority of ARS victims of the attack—and the current plan has the American people on their own during this timeframe.

Without help during this period, the number of casualties will be staggering. According to the NNPS, “Victims will continue to absorb radiation doses while waiting on rescue and this will result in an increased likelihood of death.” Victims lucky enough to get themselves to this perimeter will be able to receive help in the form of decontamination, which will help halt further radiation damage but do nothing for the harm from the radiation already received. In other words, absent a cure for ARS, decontamination will do nothing to help those who have already been irradiated to the level that triggers ARS. For the vast majority of evacuees from the impacted area, currently planned rescue and medical efforts provided at the periphery will have little impact on mortality.

Absent first responders to assist in response efforts, the situation within the area of the blast—most likely the entire metropolitan area of one of the nation’s largest cities—will be horrific. Power will be out for some period of time. The area of outage, according to the NNPS, is likely to span several states. The NNPS further states that power will be out for a period of several days to weeks. There will be no street lights to direct evacuation traffic flows. There will be no street lamps to light evacuation routes.

Together the loss of power and the effects of the electro-magnetic pulse (EMP) will render most modern means of communication—cellphones, television, radio, blackberries, most Internet services, and even most satellite communications devices—inoperable.

Without direction, victims will be left largely in the dark about the proper courses of action. For some, the best course of action will be to shelter in place. However, such a response runs counter to normal human instinct. Without the ability to receive information from authorities, most people will leave their homes, offices and other places of shelter and seek to evacuate—in doing so they may only increase their likelihood of contracting ARS and dying.

Most food and water will be contaminated; ingesting these staples will cause further radiation injury. Depending on the timing of the attack, parents will be separated from their children, with little or no hope of reuniting during the immediate future. ATM machines will be down. Phone-dependent credit card transactions will be halted. People will have only cash-on-hand-reserves to pay for survival necessities.

Without police and military units, which will be kept out of the area do to the risk of ARS, some measure of chaos, and likely violence, is inevitable. Curfews will exist only for the truly law abiding and scared.

It may take up to two weeks before radiation in the downtown area falls below the Civil Defense “all clear” standard. Those who die from the blast will be left where they fell. The injured who cannot fend for themselves and make their own way out of the blast area will soon succumb. Bodies will litter the roadsides and rubble. Soon these corpses will begin to decompose and fester causing a wave of disease among a population that is already immune-suppressed from ARS.

Additionally, the timing of medical relief efforts under the current Strategic National Stockpile System does not fit the nuclear attack scenario. Whatever medical help we have to offer will arrive too late.

This system will not work for a nuclear attack. The deadly effects of nuclear radiation will have begun before this system can reach people with drugs. In a nuclear attack contamination will cause and require an evacuation Diaspora. Unless we reach these victims before they are spread around the nation we will have no way of catching them in time. In other words, if we let our preordained, one-size-fits-all system for distributing drugs determine our nuclear response, we will have no way to save these people.

This disconnects between plans and reality is, however, not, at base, DHS’ fault. Absent a drug to treat ARS, any realistic plan is doomed to failure. And, DHS has not been given an ARS drug to work with by HHS, which is charged with procuring such drugs.

**Our nuclear response planning should focus on getting NEUMUNE out to the greatest number of victims in the fastest possible way.**

How do we achieve this?

Based upon the damage ARS does and the speed at which these health impacts occur, the drug will need to be forward deployed in all high-risk areas, such as in and around major metropolitan areas, nuclear power plants, nuclear weapons facilities, nuclear waste facilities, and designated national security events. Within these areas, NEUMUNE stocks will need to be decentralized to give victims the maximum opportunity to obtain the lifesaving drug. For example, we should seriously consider pre-positioning the drug at stadiums, large malls, post offices, fire and rescue stations, police stations, hospitals, major employers, and schools and universities. Along these lines, the NNPS focuses heavily on using first responders and military units to set up decontamination stations. These units will become natural distribution points to get everything from food to blankets into the hands of vast numbers of victims and radiation refugees. It would make sense to equip these decontamination centers with NEUMUNE, which could be handed out to people as they enter the decontamination process.

Further, the forward deployment of NEUMUNE has the advantage of knowing, generally speaking, where we need to get the drug to be most effective. We not only know with some degree of certainty the most likely terrorist nuclear targets, but we also know if such an attack were to occur where we would need the drug to be available. We have the benefit of years of data about common prevailing weather conditions for most if not all of these target areas. We know what areas will most likely be downwind of an attack.

The NNPS itself notes the importance of downwind focused efforts:

Early emergency response efforts have historically been focused on lifesaving needs close to the emergency site. However, other actions need to be taken downwind where the plume will deposit radioactive fallout. Perhaps the greatest impact on saving lives will be activities immediately following the detonation that address the reduction of the future radiation dose that will be received by the population in the fallout zone immediately downwind of ground zero.

We can pre-position the drug in the likely epicenter (e.g., downtown) and in the most likely downwind regions. Beyond these commonsense initiatives, our planning processes should also consider more creative mechanisms to pre-deploy and push NEUMUNE out to the affected population. For example, in the area adjacent to ground zero, and directly downwind from the epicenter, the areas that will be hardest hit, we might use other means, perhaps even including carpet-air-drops, to get NEUMUNE into victims' hands. We should also find ways—ranging from the bully pulpit to a tax break—to encourage people, families and businesses to have their own mini-stockpiles. When DHS called upon people to purchase duct tape and plastic wrap, these goods flew off hardware stores shelves. A similar effort here could do far more to actually protect people from the nuclear threat.

Further, we cannot simply put this drug into our stockpiles and hope that people will know what to do in the event of an attack. Any effective plan to use NEUMUNE to save vast numbers of people post-nuclear attack must begin with public education. Most Americans seem to believe that it is the nuclear blast that poses the greatest likelihood of death, when in fact they are more likely to be killed by ARS. And most think you cannot possibly survive a nuclear attack, when in fact, as I have indicated, ARS can be treated and the chance for survival can be significantly increased.

These misconceptions and knowledge gaps will undermine the ability of DHS and the other response agencies to save lives with NEUMUNE. In fact, given decades of doomsday talk, I doubt the average American believes that a mere drug could help protect them from a nuclear bomb. We need to begin to educate the American people now about how this drug can save their lives and what they should do after any such attack to avail themselves of the drug and increase their likelihood of survival. For example, in most instances, if a family has NEUMUNE in the home, and if they have prepared by stockpiling food and water, and have a sheltered room in the home, that family will be better off not evacuating immediately. Rather, they should take the drug

and shelter in place for a period of time to allow radiation levels to drop before seeking to evacuate. However, families aren't going to react in this way if they don't have NEUMUNE or haven't been educated about how to use it.

## CONCLUSION

Imagine if we fail to act now to deploy an effective medical countermeasure to a nuclear attack. Imagine that our worst nightmare comes to pass: Osama bin Laden uses a nuclear device on American soil.

Finally, imagine the impact this attack will have on the American public as night after night, the entire rest of this nation watches in utter horror as endless news coverage captures the dying, the chaos, the ruins of the blast and the streets deserted in the wake of the fallout. The video footage will be heart wrenching. Victims left trapped under the wreckage will be seen crying for help and no help will be coming. Photographers will capture first responder units sitting on the periphery unable to go in to help. Military units, finally unable to stand these images, will disobey orders and will go in to help, only to become sick. The Pentagon will struggle with how to handle growing widespread dissension in the ranks. Television crews will track the demise of hundreds of thousands of people as ARS slowly kills them. We will hear limitless stories of families shattered, promising lives extinguished, and other boundless tragedies and ironies.

If our attackers are smart they will leave little in the way of a return address. Our political and military leadership will look impotent as they struggle with how to respond to the greatest tragedy in our nation's history—in the words of Harvard's Graham Allison, the author of the leading text on the nuclear threat, this tragedy "will make 9-11 look like a pin prick."

Commentators will appear on the network and cable news stations talking about a drug that could have saved hundreds of thousands lives had it only had been stockpiled and on hand. Talk radio will be awash with allegations of a vast conspiracy that allowed this to happen. Political leaders will call for hearings and investigations. New commissions will be formed to once again tell us that we suffered a "failure of imagination" yet again.

The failure of imagination here will not be our inability to imagine what the terrorists seek to do to the American people. We know that Osama bin Laden and Al Qaeda are working day-in-and-day-out to attack us with a nuclear device. Bin Laden has said so himself.

Here the difficulty is in the inability to imagine how to respond to that threat.

Imagine how the public will judge their leaders if, after a nuclear attack, they learn a drug was available that could have saved hundreds of thousands of lives.

How will our leaders explain why so many people died unnecessarily from a nuclear attack when there was a drug that could have saved them but their government wasn't willing to make it available to America's cities?

I ask your help today in ensuring that we look carefully at why this country remains unprepared to deal with the greatest threat facing our nation: a nuclear detonation on American soil.

Thank you for the opportunity to appear before you today.